

## Book Reviews

DYNAMICS OF HUMAN REPRODUCTION: BIOLOGY, BIOMETRY, DEMOGRAPHY. By James W. Wood. Hawthorne, NY: Aldine de Gruyter. 1994. 653 pp. ISBN 0-202-1180-1. \$39.95 (paper).

Despite the overwhelming concern of biological anthropologists with matters of evolutionary significance, until recently few have spent much time thinking about the precise determinants of fertility variation in human societies. Perhaps we are all heirs to Darwin's perspective, inherited directly from Malthus, that most population growth, whether positive or negative, results primarily from changes in mortality, while levels of fertility remain nearly constant. Of rapidly colonizing species, Darwin (1859:118) clearly noted: "no one supposes that the fertility of these animals or plants has been suddenly and temporarily increased" but rather "that there has consequently been less destruction of the old and young." However, research over the last decade or so by a relatively new subgroup of biological anthropologists dubbed "reproductive ecologists" has shown that the degree of variability in fertility both among and within traditional human societies is anything but trivial.

James W. Wood's *Dynamics of Human Reproduction: Biology, Biometry, Demography* is a comprehensive, almost encyclopedic, account of the major biocultural determinants of fertility variation in traditional human societies. It successfully brings together, for the first time, most of what is known about the human reproductive process from the work of anthropologists, demographers, and statisticians. The volume is organized into three main sections entitled "Natural Fertility," "The Proximate Determinants of Natural Fertility," and "Beyond the Proximate Determinants." These are followed by a 37 page appendix, coauthored with K.L. Camp-

bell, that serves as a primer on hormonal assays and problems of interpreting the endocrinological data yielded by them.

In the three chapters that constitute the first section, "Natural Fertility," Wood begins by dispelling the popular notion that reproductive output among so-called "natural fertility populations" (noncontracepting populations that practice neither sterilization nor induced abortion) is uniformly high. Instead, it is shown, first, that there is a wide range of variability in fertility rates exhibited by these populations and, second, that in no population does the total fertility rate approach anywhere close to the theoretical human maximum. This important and somewhat paradoxical finding—that *uncontrolled* fertility does not equal *unrestrained* fertility—has probably been the single most important reason for the growth of anthropological and ecological studies of reproduction in recent years. Having set up the main issue to be addressed, Wood then introduces his analytical framework (essentially a revision and elaboration of a model first proposed by Davis and Blake in 1956) for studying the determinants of fertility variation in natural fertility populations. Rather than trying to take account of the multitude of factors, both biological and cultural, that may influence fertility in traditional human societies, this framework focuses on just nine fundamental "proximate determinants" of fertility. All fertility differentials are then understood in terms of how these nine determinants vary both within and among populations, and the extent to which these proximate determinants are themselves influenced by more distant cultural and environmental factors. This model is especially appealing for both its explanatory power and amazing simplicity.

In the second section "The Proximate Determinants of Natural Fertility," Wood presents a comprehensive 400 page treatment of the individual factors that lead to fertility variation in traditional human societies. In-

cluded here are discussions of variability in age at menarche, the length and adequacy of ovarian cycles, conception and fetal loss rates, breastfeeding practices and their impact on postpartum ovarian function, patterns of reproductive senescence, and a short section on male factors in fertility variation. The discussions are uniformly readable yet sophisticated, frequently uniting data from endocrinological studies with mathematical modeling in a series of efforts to identify the biocultural sources of reproductive variability and the potential effects of these sources of variability on outcomes of demographic interest, such as birth-interval durations or intrauterine mortality rates.

The third and final section of the book, "Beyond the Proximate Determinants," details the complexities of analyzing fertility in the real world. Whereas in previous chapters each proximate determinant of fertility is considered individually, in the final chapter the difficulties introduced by the interaction of the determinants are addressed. In addition, while previous chapters stress that each proximate determinant can in theory have an impact on total fertility levels, the final chapter of the volume includes a sensitivity analysis that evaluates the magnitude of such effects. The sensitivity analysis shows that differences in the duration of lactational infecundability play a greater role in generating variability in natural fertility levels than any other factor including age at menarche, age at menopause, or rates of fetal loss. This finding corroborates what many researchers outside of anthropology, such as reproductive physiologist Roger Short or demographer John Bongaarts, have believed for quite some time, though it begs the question of what proximate factors generate variability in lactational infecundability in the first place. Given that scholars representing most of the major international development organizations have recently endorsed the lactational amenorrhea method (LAM) as an effective means of natural contraception in the first 6 months postpartum, I expect that "use-effectiveness" studies of lactation (comparable to those conducted for artificial means of contraception) will be a prime focus of research by reproductive ecologists in the coming decade. The last

section of the book also includes a discussion of what are termed "more remote influences on fertility" such as nutrition, seasonality, and genetics. This brief section will particularly pique the interest of those concerned with the evolutionary ecology of reproduction, and though some might lament the relative scarcity of more clearly evolutionarily based discussions in this volume, truth in advertising prevails: it is about biology, biometry, and demography—all on a proximate level.

Most readers will find this book to be a "page-turner" in more than the usual sense of the term. It contains a voluminous number of figures that, more often than not, are absolutely integral to the discussion and provide the reader with clear and intuitive illustrations of concepts presented in the text. These figures are grouped, however, at the ends of chapters, making frequent flipping between the text and the figures a necessity. Although somewhat annoying, "ganging" the figures in this way apparently served to keep the production cost of the book down and therefore has the advantage of rendering this hefty tome remarkably affordable.

A note should be made about Wood's liberal use of advanced mathematical models and, associated with them, a large portion of the Greek alphabet. A quick flip through this book is likely to produce a gag reflex and waves of terror in those potential readers who are not so mathematically inclined. Individuals for whom factorial expansions, matrices, and integral equations are a distant memory need not despair, however. All concepts that are presented mathematically are invariably explained intuitively as well as illustrated graphically. Thus, those baffled by the mathematical characterizations of Poisson or negative binomial patterns of reproduction quickly learn that the former is simply the case where the mean and variance of fertility levels are roughly equal, while in the latter case, the variance exceeds the mean. Further head-scratching can be dispensed with by checking the figure that illustrates, using data from four actual populations, what Poisson and negative binomial patterns of fertility actually look like. And those for whom mathematical models are

things of beauty will find due cause for revelry here.

Overall, I found this to be an excellent book that combines innovative and solid scholarship with clarity of writing. It is a "must-have" reference text for any researcher interested in the biocultural determinants of human fertility and is appropriate as a textbook at the graduate level. I expect it to remain a standard in the literature of demographic anthropology and reproductive ecology for many years to come.

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#### LITERATURE CITED

Darwin C (1859) *On the Origin of Species by Means of Natural Selection, or The Preservation of Favoured Races in the Struggle for Life* (facsimile of the first edition). London: Penguin Books.

**A FIELD GUIDE TO JOINT DISEASE IN ARCHEOLOGY.** By Juliet Rogers and Tony Waldron. New York: John Wiley. 1995. 119 pp. ISBN 0-471-95506-X. \$48.00 (paper)

As its title suggests, this book is intended as a compact guide to identification and classification of joint disease in human skeletal samples. Many will find the authors' approach to the topic quite unique, especially their discussion of disease definition and classification. While the book's emphasis on distinguishing between disease and aging processes and between disease incidence and prevalence is laudable, its incomplete and out-of-date bibliography gives some hint of the book's many inadequacies. Its citations overlook a substantial literature in paleopathology and population-oriented studies, and frequently tend not to be peer-reviewed publications. Unfortunately, it is this failure to address the extensive clinical, pathological, and paleopathological literature which fatally flaws this book.

The authors' own descriptive and classificatory approach to disease seems so conjectural that their comment that "modern pathology has so little to offer" (p. 99) belies their total disregard of the contributions of clinically documented skeletal collections to this field. This segregation of paleopathology from clinical and pathological investigations (as illustrated in Fig. 1.2) is lamentable, because the spectrum of disease actually manifest is established from known clinical and pathological case studies, and properly informs the creation of diagnostic criteria.

Thus their statement that "appearances may or may not conform to modern textbook appearances" (p. 15) underscores the authors' own idiosyncratic approach. This disregard for clinical criteria may also have sponsored many of the conceptual inconsistencies that have compromised this volume. For example, it is correctly acknowledged (on p. 7) that peripheral joint ankylosis does not occur in rheumatoid arthritis, yet Chapter 6 mistakenly holds this condition to *identify* rheumatoid arthritis! Although there are many to draw from, only a few of the book's major errors will be discussed here.

The treatment of osteoarthritis is especially problematic. While making the excellent point that osteophyte size is unrelated to disease severity, the book then refers to flat, joint-surface plaques as equivalent to osteophytes (p. 26). This is certainly not standard usage, nor is it consistent with the subsequent assertion that such plaques are *not* part of osteoarthritis. Contrary to the theory expressed, osteophytes are not "a minor criteria" [sic, p. 26] for classification of osteoarthritis, and its diagnosis based on eburnation alone is at variance with the peer-reviewed literature (which also criticizes surface pitting for this use, as advised here). Similarly, the claim that "except the eburnation of osteoarthritis, there are no pathognomonic signs" (p. 15) contradicts the medical literature, which notes the premier position of synovial joint osteophytes, just as "the cardinal sign of osteoarthritis on an x-ray is narrowing of the joint space" (p. 37) is false, such narrowing having been shown